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ABSTRACT

Intended for use by local school district staff, this manual provides step-by-step guidelines for planning and implementing the incorporation of computer-based instruction in the curriculum. Procedures involved in five phases of planning and implementation are outlined, covering: (1) preliminary planning, where schools should establish planning committees, conduct staff awareness activities, develop educational philosophy and policies, document current computer-based activities, identify resources, conduct awareness sessions for key groups, and establish priorities; (2) curriculum planning, which involves the development of broad goal statements, student competency statements, curriculum objectives, and instructional strategies and applications; (3) staff development, where schools should determine required and existing faculty computer competencies, develop and provide training and other staff activities, and evaluate these activities; (4) instructional materials and equipment acquisition, where schools should review curriculum objectives and instructional applications, determine courseware and hardware needs, and prepare procurement specifications; and (5) organization and implementation, which involves appointing a program coordinator and establishing logistical support, materials and equipment support, and an implementation support system. It is noted that the planning and implementation process must be repeated and expanded over time. Flowcharts illustrating the process and a five-item bibliography are provided. (ESR)

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GETTING STARTED

PLANNING AND IMPLEMENTING COMPUTER INSTRUCTION IN SCHOOLS

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GETTING STARTED

PLANNING AND IMPLEMENTING COMPUTER INSTRUCTION IN SCHOOLS

The University of the State of New York
The State Education Department
Center for Learning Technologies
Albany, New York 12230

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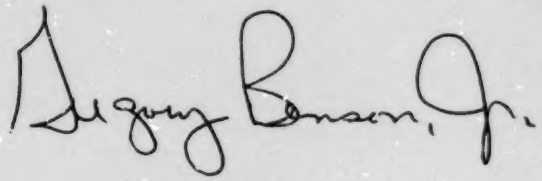
FOREWORD

New and emerging learning technologies, particularly computers and educational software, offer significant opportunities to deliver instruction effectively and productively. In some cases, the incorporation of computer-based instruction into the curriculum may have a revitalizing influence on the total instructional program.

With these opportunities, however, come challenges: the efficient use of these new interactive technological tools is a complex task. While many districts have initiated some computer activities, few have undertaken the development and implementation of comprehensive programs. That's what *Getting Started* is for: helping teachers and administrators make the transition from exploration to comprehensive program planning and development.

This publication is the first in a series of resource guides to be produced by the Center for Learning Technologies. The purpose of the series is to help local school district staff plan and implement meaningful and appropriate uses of interactive learning technologies.



Director,
Center for Learning Technologies

CONTENTS

Foreword ii
Acknowledgments iii
Introduction iv
Stage 1: Preliminary Planning 1
Stage 2: Curriculum Planning 6
Stage 3: Staff Development 10
Stage 4: Instructional Materials and Equipment Acquisition . 14
Stage 5: Organization and Implementation 17
Recapitulation 20
References 21

Acknowledgments

Getting Started was written for the Center for Learning Technologies by Charles Mojkowski of Educational Consulting Services, Cranston, RI. Eileen Gress, Director, District Instructional Materials Center, Fairport Central Schools, Fairport, New York, made substantial contributions to early drafts of this publication. Robert Reilly, Associate, Center for Learning Technologies, coordinated the publication activities, which included the efforts of many within and outside the State Education Department. Bruce Stewart, State Education Department, Audio Visual Center, designed the cover. The efforts of all are deeply appreciated.

Credit is given to the Minnesota School District's Data Processing Joint Board, Minnesota Department of Education, for its generous permission to use the Computer Literacy chart.

INTRODUCTION

Developing a comprehensive computer-based education program is very much like undertaking a long and difficult expedition — more like climbing Mount Everest than going to the market. And, because no self-respecting climber would consider the purchase of ropes, tents, and boots as sufficient preparation for climbing Everest, no educator should consider the purchase of a few microcomputers and some instructional software as adequate preparation for developing and implementing a comprehensive program. The process is complex, and there are many decisions to be made before students can be instructed in the new technologies — decisions about creating awareness and understanding among the faculty and the community, about curriculum planning and staff training, and about providing instruction.

Getting Started is a step-by-step guide for helping educators identify the essential activities and address the major issues relating to using microcomputers in schools. The task is enormous, so we have broken it down into a small, manageable number of segments. Written primarily as a series of checklists, this guide identifies the key planning and implementation stages and describes the activities that need to be completed at each stage.

Getting Started will help educators who have the primary responsibility for designing and implementing computer-based education programs in schools. It will, however, be useful to anyone — parent, school board member, community representative — who is interested in computers and wants to help educators and students use them in meaningful and appropriate ways. This guide begins "at the beginning," before computers are bought and teachers are trained, but it is useful regardless of the stage a district has reached in its own program. Those further along in the process can look back to see whether they have overlooked anything.

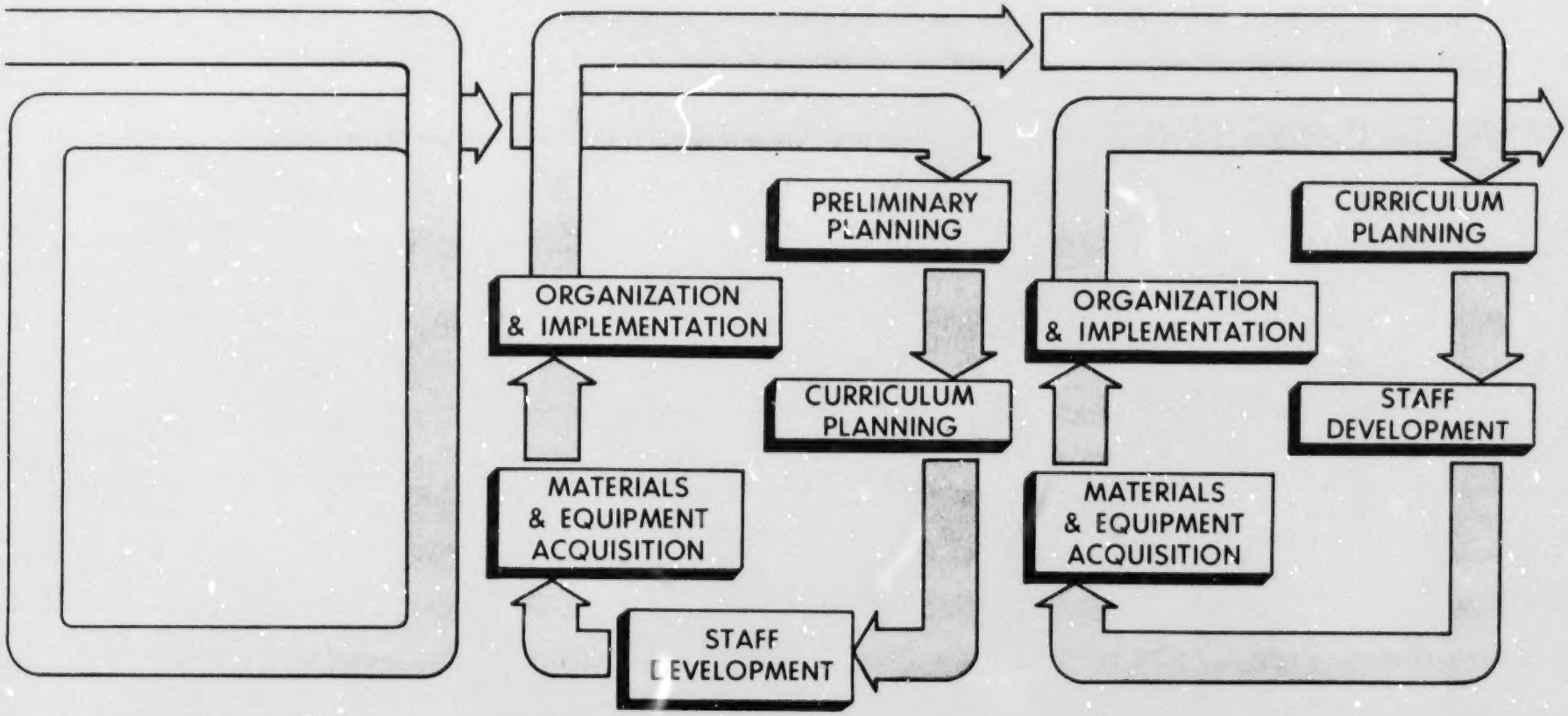
With so many school districts already using computers in one way or another, *Getting Started* may appear to be a little late on the scene. Not so! In fact, the timing is just about right. Most districts have introduced staff to computer instruction and explored a few classroom applications, but many have yet to undertake the serious planning and development that distinguish a comprehensive program from fragmented, piecemeal tinkering. There is more readiness now to move from experimentation to program development, to build upon the experiences gained thus far in order to create meaningful educational applications of interactive technologies.

The planning and development process has five overlapping stages that need to be repeated at regular intervals over a multi-year period:

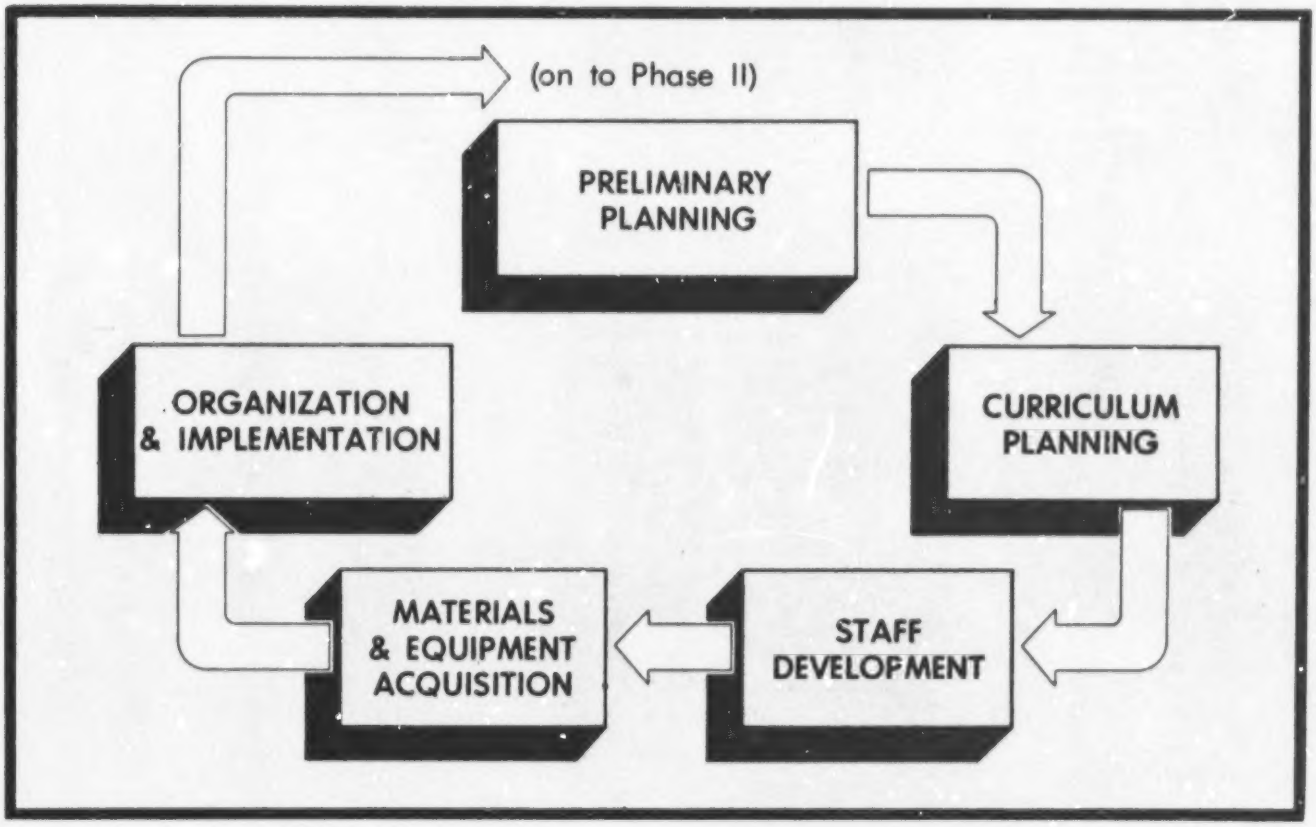
1. preliminary planning
2. curriculum planning
3. staff development
4. instructional materials and equipment acquisition
5. organization and implementation.

Figure on the following page illustrates that the overall process is something like a spiral, constantly repeating and expanding over time. With the technology changing so rapidly, it may be necessary to repeat the sequence several times over the next five to ten years. This guide deals with Phase I of the that process.

Planning and Implementing Computer Instruction Programs



STAGE 1
PRELIMINARY PLANNING

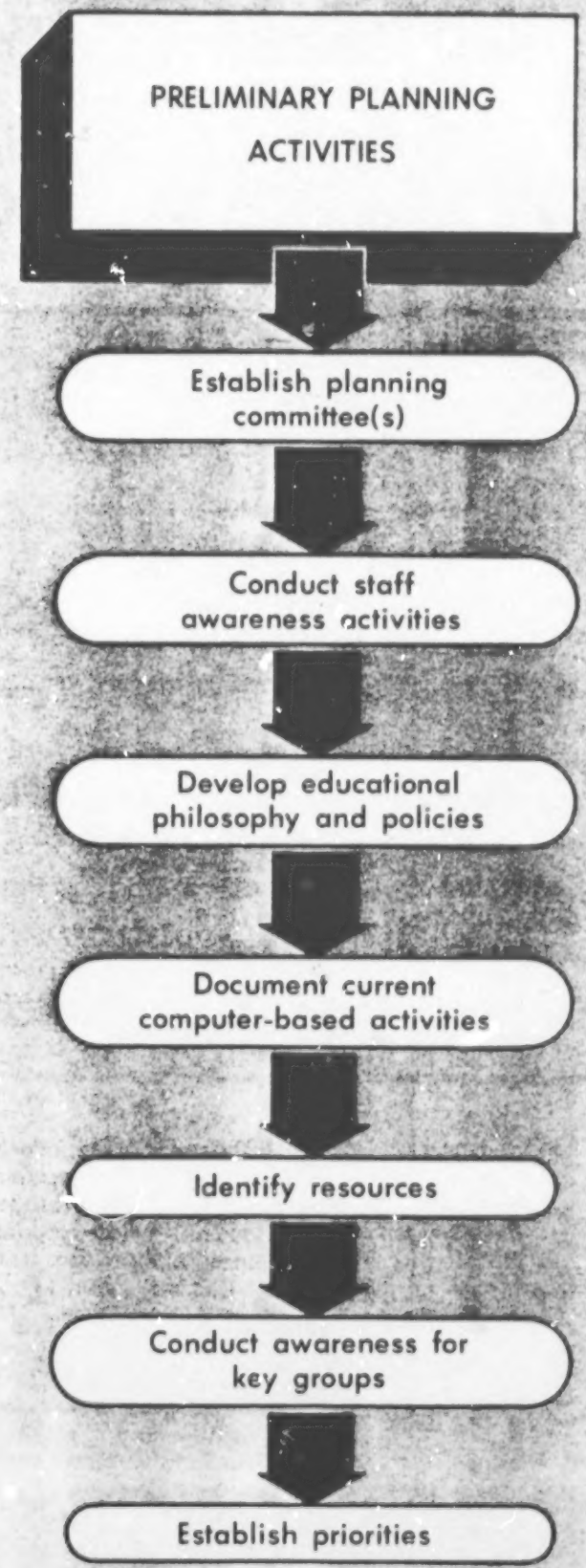


Preparation is everything (or nearly so) in implementing computer education in schools. This first stage of the process is essentially pre-planning. Before you start detailed curriculum planning, there are several preliminary activities that you need to conduct.

What Needs To Be Accomplished:

- Developing a planning structure and process
- Establishing a broad sense of direction
- Gaining support and commitment from key groups

What To Do:



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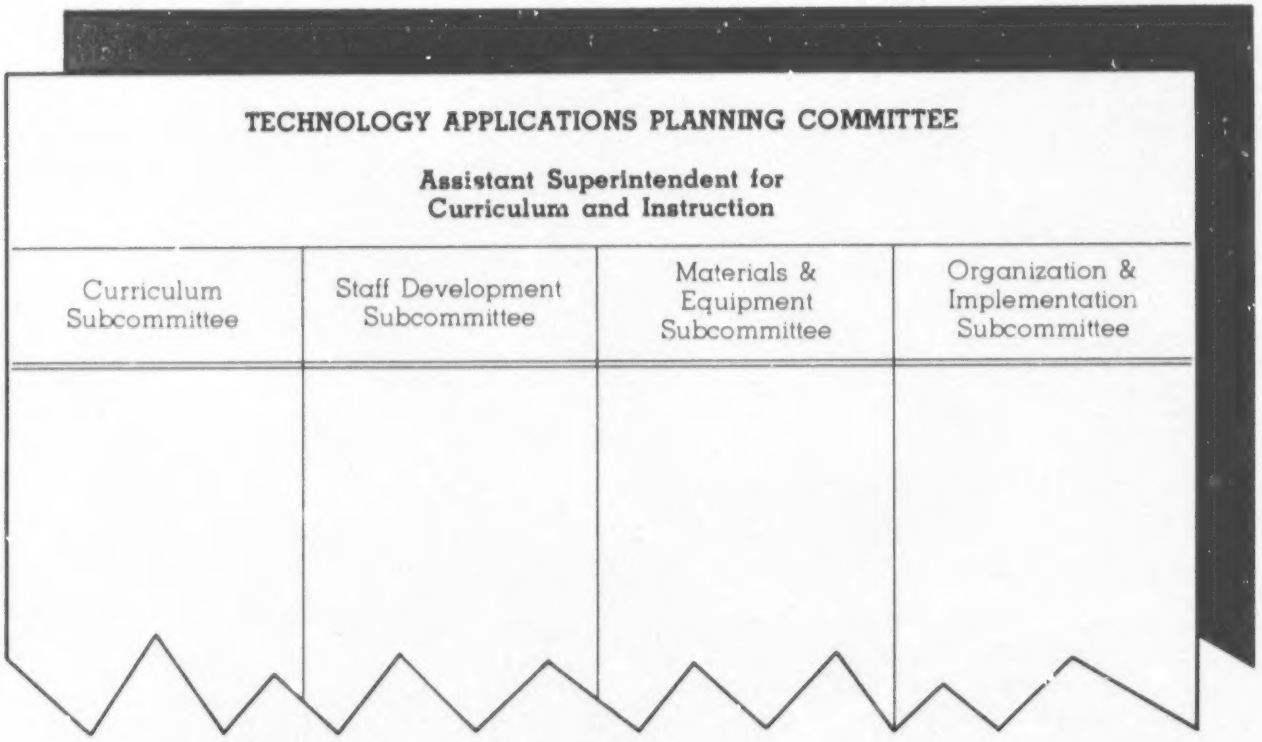
Establish Planning Committee(s)

There are several ways in which the committee might be organized: by broad grade levels (elementary, junior high/middle, secondary); by subject matter area; by planning areas (courseware, hardware, staff development, etc.). We recommend the latter because it fosters multidisciplinary involvement.

Here's an example of a committee structure using planning areas as an organizational framework:



In this sample structure, the committee is composed of five members: the Assistant Superintendent and the chairpersons of the four subcommittees. Each of the subcommittees is composed of faculty and other resource people (e.g., consultants, community members, parents). While all of the people involved may meet collectively only once or twice, the individual subcommittees and the coordinating committee would meet regularly and frequently to accomplish the actual work. The advantage of this particular structure is that many faculty members can be involved while maintaining focus on a specific area. This organization requires good communication among coordinating committee members.

Conduct Staff Awareness

The purpose of these initial awareness sessions is to introduce the faculty to interactive technologies and prepare them to conduct the detailed planning and development necessary for a comprehensive program.

A suggested list of topics for these introductory sessions follows:

- Technology Applications in Education—Today and Tomorrow
- Computers—A Technical Overview
- Courseware and General Purpose Software
- Implications of Computers and Related Technologies for Curriculum, Staff Development and Organization
- Future Applications of Computers in our District—An Overview and Discussion

Develop Educational Philosophy and Policies

This statement should delineate the rationale for using technology in the schools, including assumptions about the future, and the mission of the schools with respect to technology. The philosophy should also address critical issues with respect to the use of technology in education, such as equitable access, programmatic priorities, and goals.

Policies are required to guide the allocation of planning and development resources. Some areas in which policies may be needed are

- Organization and staffing
- Staff development
- Program emphasis (grade levels, subject areas)
- Curriculum

Document Current Computer-Based Activities

As a baseline report for the planning committees, describe current status of computer use in the district. The inventory should contain the following elements:

- Hardware (number, type, location)
- Courseware (content, hardware compatibility, location)
- Applications (by type: CAI, CMI, programming, general purpose software tools; by subject area)
- Staff training (number of staff with competencies and experience)

Identify Resources

Identify what resources will be needed to complete the planning. Consider your needs in terms of

- Information (trends in technology, research and practice)
- External expert assistance (for technical advice)
- Staff time (for meetings and report preparation)
- Materials (reports, journals, special publications)

Establish Priorities

Not all of the planning can be accomplished during Phase I (see Figure 1 on page v). Some preliminary priorities need to be established in order to guide the committee work. Consider these questions:

- What goal areas, grade levels, and subject areas/applications will be given initial or predominant attention?
- What criteria are used to select these planning priorities?
- How will the computer program be phased in over the next three to five years?

CONSIDER:

- Include interested and knowledgeable staff on the planning committee; their expertise will be necessary.

- Involve enough skeptics to keep the planning process open. Provide opportunities for airing concerns and "minority reports."

- Select planning committee members from various grade levels and subject areas; avoid having the planning identified with any one segment even though some areas (for example, senior high grade levels or the hard sciences) may be given extra attention initially.

- Use multiple formats for conducting awareness. Some information can be passed along in print materials, some through lectures, and some through demonstrations. Avoid information overload.

- Don't force the same awareness activities on all staff; some faculty already have a basic understanding of technology and microcomputers.

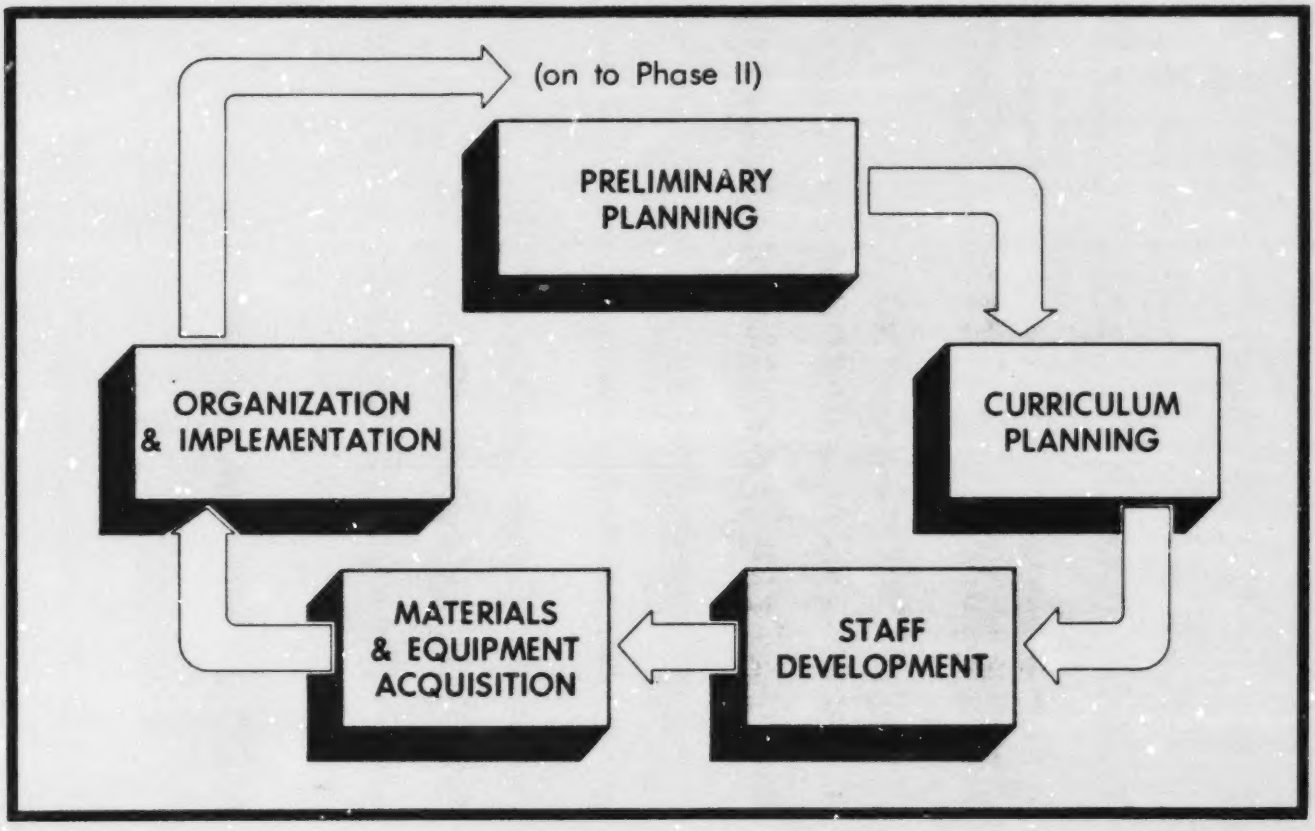
- Involve building principals and other key administrators early in the process; they are critical to widespread acceptance and involvement of teachers.

- Delay conducting awareness for other groups (school boards, parents, community members) until additional preliminary activities are completed. The products of these efforts can then be shared, even if in draft form.

- Start small, regardless of the resources available; it's easier to keep a small effort focused, and the inevitable problems will be more manageable.

- Document the planning process and its outcomes. It may be necessary later on to explain how and why decisions were made.

STAGE 2
CURRICULUM PLANNING



Implementing computer-based instruction in schools is primarily an educational problem, not a technical one. For this reason, teaching with and about computers needs to be integrated with your district's existing curriculum. You will find that incorporating new, computer-related competencies into the curriculum will force you to examine the entire instructional plan. For example, using computer simulations in the science lab affects decisions such as which experiments are more appropriately simulated, the time required for the simulations (often less than for the actual experiment) and the analysis of the data.

What Needs To Be Accomplished:

- Specifying what students should know and be able to do with computers
- Revising the existing curriculum to incorporate computer-based instruction

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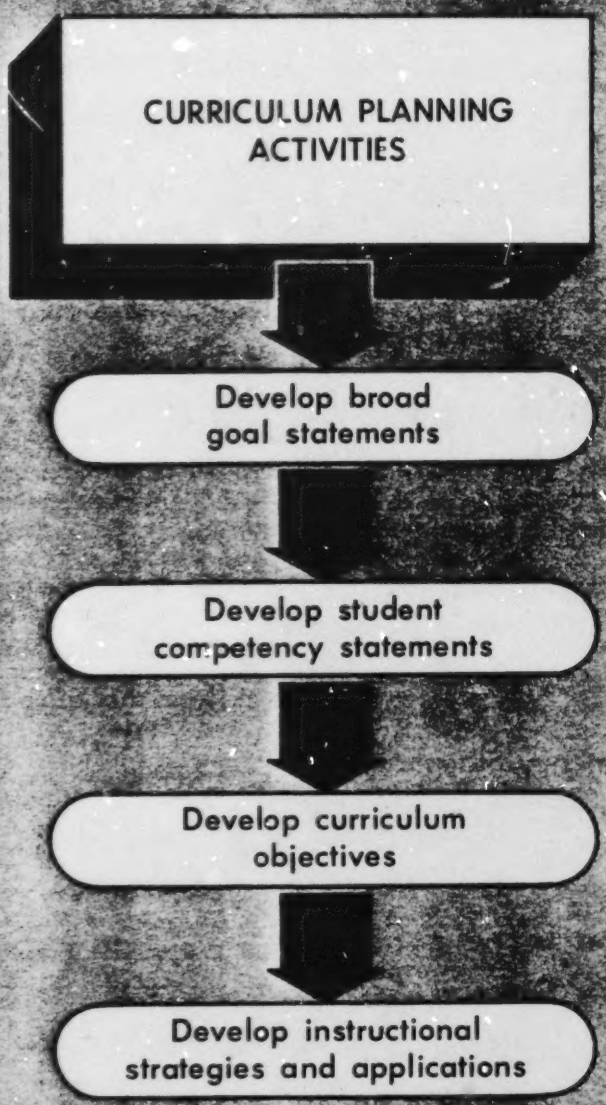
What To Do:



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Develop Broad Goal Statements

At this stage, you need to specify what you want students to know about computers and be able to do with them. This is often referred to as "computer literacy." One set of broad literacy categories that may be useful is that proposed by Robert Taylor. He suggests that the computer can be used in three ways: as a tutor (computer-assisted instruction), as a tool (for word processing or graphics), and as a tutee (programming the computer to perform special operations). Using this set of categories, broad goals statements might look like the following:

> Students will be able to use the computer as a teaching device to learn.
>
> Students will be able to use the computer and appropriate software to communicate and compute.
>
> Students will be able to instruct the computer to perform special operations.

Of course, you will likely want to use different words or emphasize different forms of literacy. You may want to establish a goal which deals with basic technical competencies in using equipment, or a goal relating to the social and historical aspects of computers. The important thing is that you develop an organizing framework for your curriculum.

Develop Student Competency Statements

For each of the goal statements, you need to create a list of student competencies. Here are some examples:

> Students will know the parts of a computer system and use them in running prepared software.
>
> Students will be able to select and use a general-purpose software program for creating graphic displays of data.
>
> Students will be able to select and use word processing software to complete writing assignments.

These statements need to be based on what you believe students will need to be able to do with computers in continuing their education and in work. Given that the technology is changing rapidly, these statements will need to be reviewed and updated regularly. For example, it is likely that the laser videodisc soon will be used with the computer as a learning and resource tool. Students will need to learn how to use this device. Also, general-purpose programming tools will make learning current programming languages unnecessary for most students. Students will need to know about these new tools and how to use them.

In addition to statements dealing with specific skills and knowledge, you may wish to develop statements relating to the development of appropriate attitudes regarding computer applications. For example, you may wish students to understand the limitations of the computer or its potential for misuse through invasion of privacy.

Develop Curriculum Objectives

To this point, you will have developed broad goals and competency statements. Now they need to be linked to the existing curriculum. We do not advocate the development of a separate computer curriculum that runs parallel to, and does not integrate with, the total instructional program.

The linkage between the computer literacy competency statements and the total curriculum is made by assigning each statement to one or more subject-matter areas, and modifying it to reflect the specific computer application that will be made in that subject area.

For example:

> **English**
> Students will be able to use a word processing program to prepare a research report, with a bibliography and footnotes.
>
> **Social Studies**
> Students will be able to use graphics software to prepare charts and graphs illustrating various characteristics of society.
>
> **Mathematics**
> Students will be able to use the LOGO programming language to calculate and draw various geometric shapes.

Three important points about linking computer competency statements to the curriculum:

1. A computer competency can be linked to more than one subject-matter area. For example, deciding whether LOGO will be used in teaching art or mathematics, or both, is one of the tasks of the curriculum committee.

2. A computer competency can be introduced at several grade levels. Deciding whether to introduce the use of a word processing program in the elementary grades depends, among other factors, on what resources (i.e., equipment, instructional materials, trained staff) are available.
3. The committee will need to judge the appropriateness of each computer competency for different students. Will, for example, all students be required to learn programming?

Thus, in preparing curriculum objectives, committee members will be deciding where in the curriculum (subject areas and grade levels) computer competencies will be introduced.

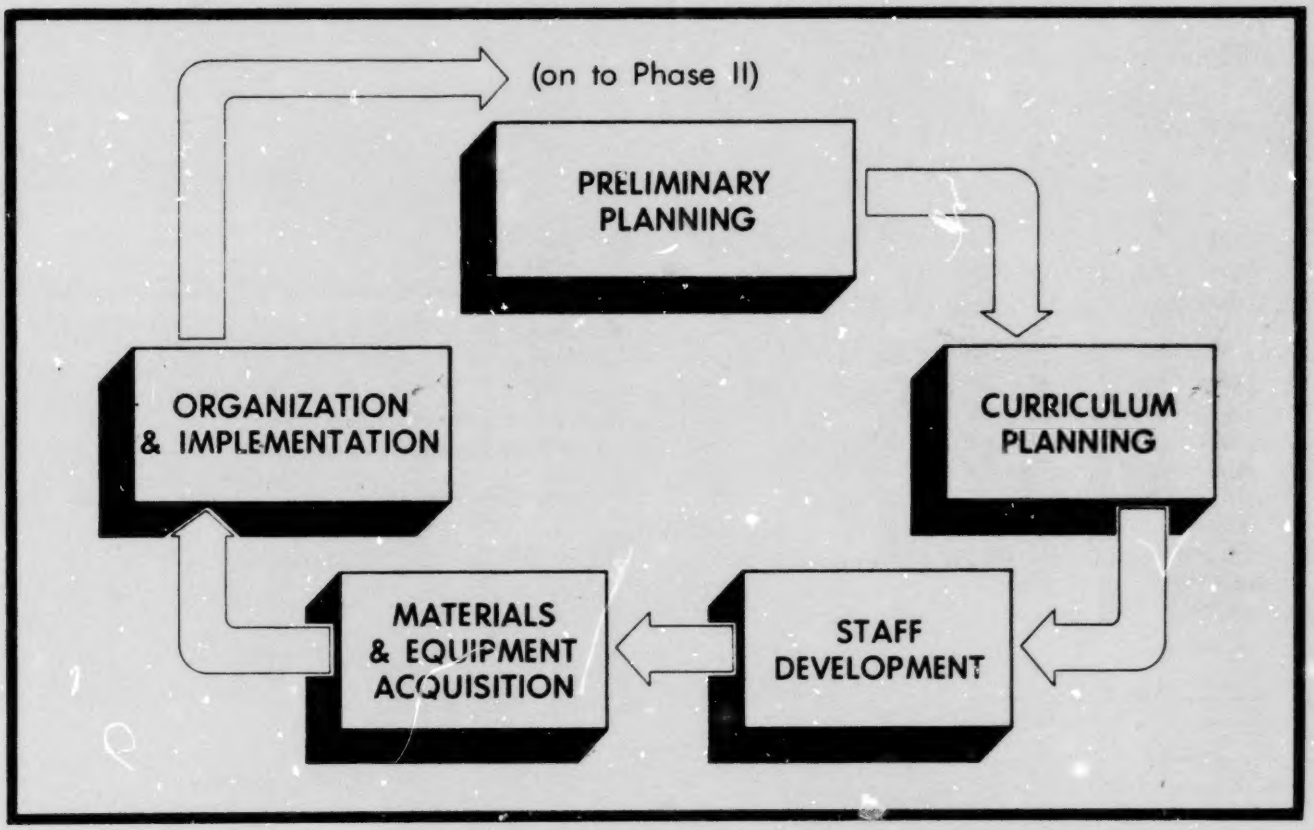
Develop Instructional Strategies/Applications

This task includes the detailed instructional planning usually undertaken by the classroom teacher. It includes the specification of the instructional approach (e.g., tutorial or simulation, large group or individual), instructional objectives, and student performance measures. It is unlikely that the curriculum planning committee will proceed to this stage of the process before other stages (staff development, materials acquisition) are completed. Moreover, we recommend that a major portion of staff development activities be allocated to this work.

CONSIDER:

- Introducing computers into the schools will not compensate for a weak curriculum. It may, in fact, highlight weaknesses. Developing a computer instruction program may provide you with an opportunity to revitalize the total instructional program.
- Teaching programming to all students may not be justified unless these skills can be applied to other areas, or can be shown to develop other competencies, such as problem-solving. Very few students will require more than a general acquaintance with programming languages in their future schooling or work.
- The integration of computer competencies into the curriculum will require special attention to the traditional problems of articulation across grade levels and subject areas. Some experts have suggested that, because of limited resources and the need to prepare those students who are graduating, emphasis be given to the secondary level. Such an emphasis will require that the curriculum be developed from the top down, contrary to the traditional process.

STAGE 3
STAFF DEVELOPMENT

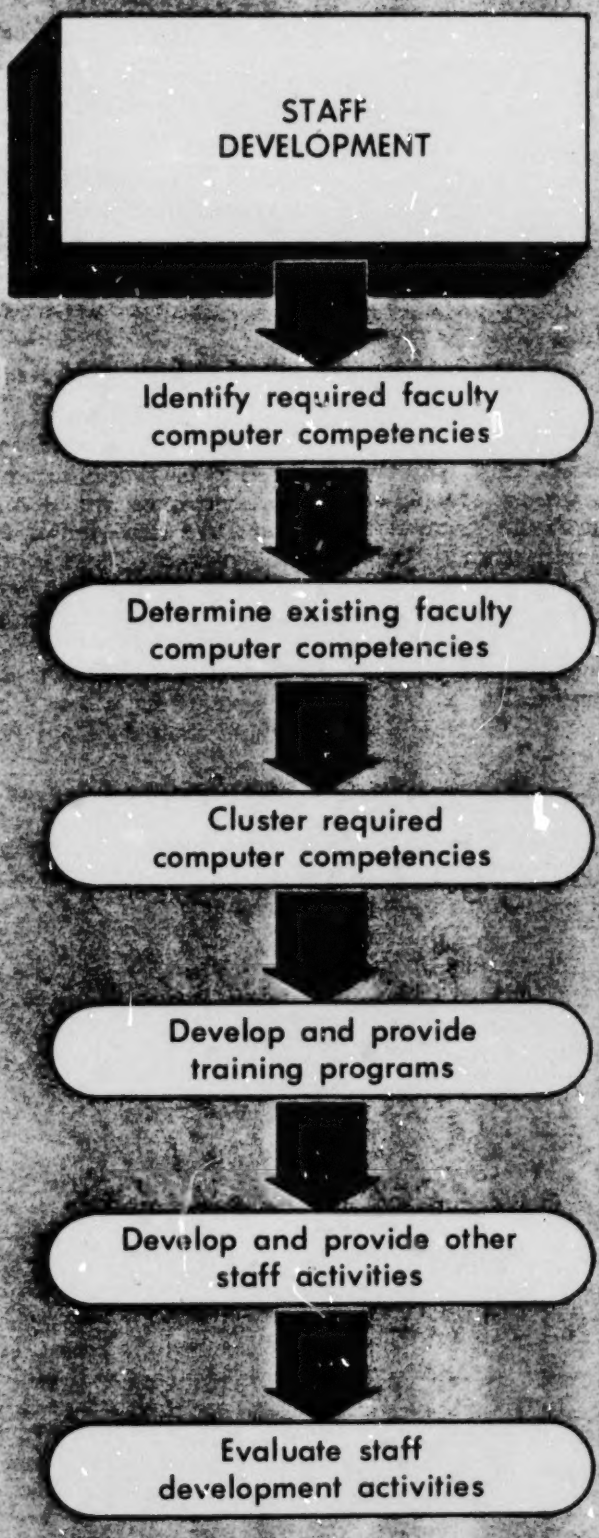


At this stage in the planning process the work of the curriculum committee begins to yield benefits. The staff development plan needs to be based on the curriculum. While we can be certain that all staff will require basic computer literacy (we try to define that in this section), it is difficult to plan staff development activities that go beyond that level without some idea of student competencies and where they are integrated into the curriculum. Note also that the term "staff development" is used, rather than "training," to emphasize the need for a comprehensive program—one that incorporates a variety of activities for preparing faculty to develop or improve competencies and performance for new or expanded roles.

What Needs To Be Accomplished:

- Developing a comprehensive staff development plan
- Organizing and providing appropriate training for faculty
- Providing ongoing support to faculty in developing instructional strategies and classroom applications

What To Do:


STAFF DEVELOPMENT
Identify required faculty computer competencies
Determine existing faculty computer competencies
Cluster required computer competencies
Develop and provide training programs
Develop and provide other staff activities
Evaluate staff development activities

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Identify Required Faculty Computer Competencies

The first step is the most logical one: find out what students need to know and then prepare teachers and administrators to deliver appropriate instruction. It does get a bit more complicated than that, however. For example, not all teachers and principals will need to have the same competencies, particularly once they move beyond the basic training.

With limited resources (both time and money) available for staff development, you will need to set priorities in terms of who will get what training according to what timetable. Thus, you will need to identify what specific groups of teachers and administrators will require what competencies. For example, if introducing word processing in ninth grade English is to be done first, ninth grade teachers will need not only basic hardware and courseware competencies, but also applications training in using word processing software to develop writing skills.

Determine Existing Faculty Computer Competencies

Many teachers and administrators have already acquired basic computer literacy and some have acquired advanced skills and knowledge. Before planning training programs and other activities, find out what faculty are already competent in what skill areas. These teachers and administrators might make excellent trainers or assistant trainers.

Cluster Required Training Competencies

Once you have identified what competencies need to be taught to what faculty members, you can organize the competencies into clusters. You may find, for example, that you can develop levels of competencies, with the first being basic hardware and software literacy, the second being applications, and the third being programming.

One way of categorizing needed faculty competencies is that provided by the Minnesota School District's Data Processing Joint Board.

LEVEL OF COMPUTER LITERACY	Can operate computer.	Can choose software.	Can run software.	Can evaluate software.	Knows computer terms.	Understands basic computer operations and capabilities.	Can use authoring languages or packages.	Can write programs.	Can develop microcomputer courseware.	
LEVEL I	X	X	X							Uses CAI in the classroom
LEVEL II	X	X	X	X	X	X				Provides information about the computer and uses CAI.
LEVEL III	X	X	X	X	X	X	X	X	X	Instructs students about computers and languages, uses CAI, and develops instructional courseware.

Develop and Provide Training Programs

This step involves making the actual logistical arrangements for the training. These arrangements include

- trainers (faculty or external experts)
- scheduling (during or after school)
- facilities
- equipment (computers and peripherals)
- courseware

Develop and Provide Other Staff Activities

Training sessions are only one element of a comprehensive staff development program. There are a variety of activities that can be used to develop or improve knowledge and skills. Consider the following:

- readings for self-study
- teaming with an experienced colleague
- visiting an exemplary school
- cracker-barrel sessions
- workshops for developing instructional strategies and materials

Evaluate Staff Development Activities

Most evaluation of inservice training is accomplished through some form of questionnaire completed by teachers at the close of the session. Given the comprehensiveness of staff development activities required, this will not be adequate. A more appropriate way might be to focus on whether faculty members can perform the skills that they are required to teach their students. Consider the following additional ways of determining that the staff development activities are accomplishing their objectives:

- conduct peer evaluation through observation and retraining
- interview a small sample of faculty members to identify strengths and weaknesses of staff development activities
- solicit self-assessments from trainees

CONSIDER:

- Staff development, like the implementation of a comprehensive computer instruction program, is an on-going process, not a one-shot affair. Design a long-range program. Aside from the intrinsic benefits, it will communicate to the faculty that the program is a district priority.

- Involve principals in staff development activities. Research and experience testify to the importance of their involvement and leadership in major educational changes.

- We know much about how to run effective inservice training. The following principles have been found to enhance computer competency training:

  The in-service training should prepare the faculty to perform the task and also provide criteria for determining their degree of success.

  Training activities should be in a sequence that gradually increases in complexity.

  The training should be sufficiently flexible to allow trainees to begin at their own level of ability and to progress at their own rate.

  Training should take place during the day and make use of actual teaching situations involving students.

  The training should be adjusted to the instructional setting that exists.

  Incentives should be provided which motivate the faculty to actively participate.

  Whenever possible, faculty of the district or school should be used as instructors in the training.

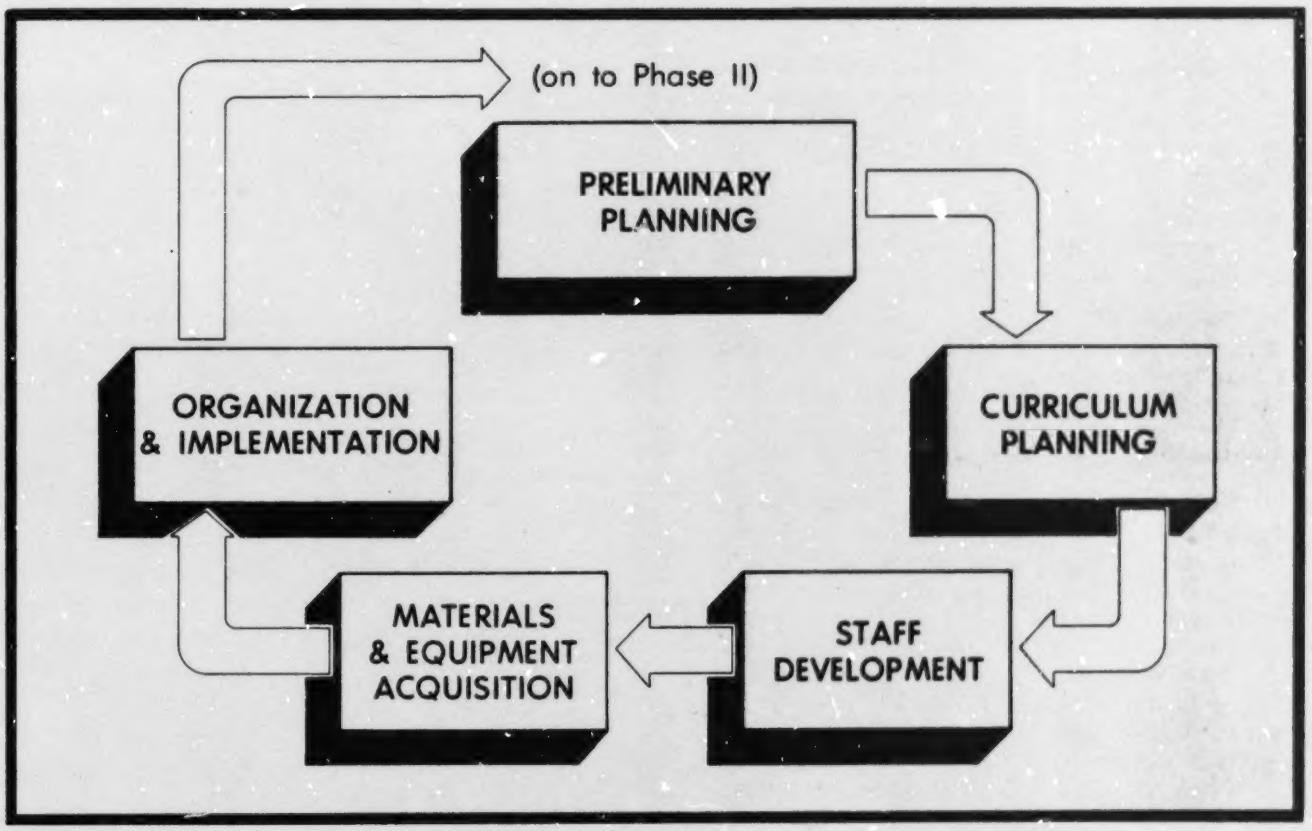
  Teachers should have an opportunity to practice new skills in the course of their regular teaching.

  Skills acquired in a training program will tend to go unused if not shown to be valued by the administrators of the school.

  Faculty involved in a training program should have continuous access to an available facilitator—a trained technical resource.

- Expect skepticism and resistance from some faculty members (it's natural), and make provisions for dealing with it openly and directly.

STAGE 4 INSTRUCTIONAL MATERIALS AND EQUIPMENT AQUISITION

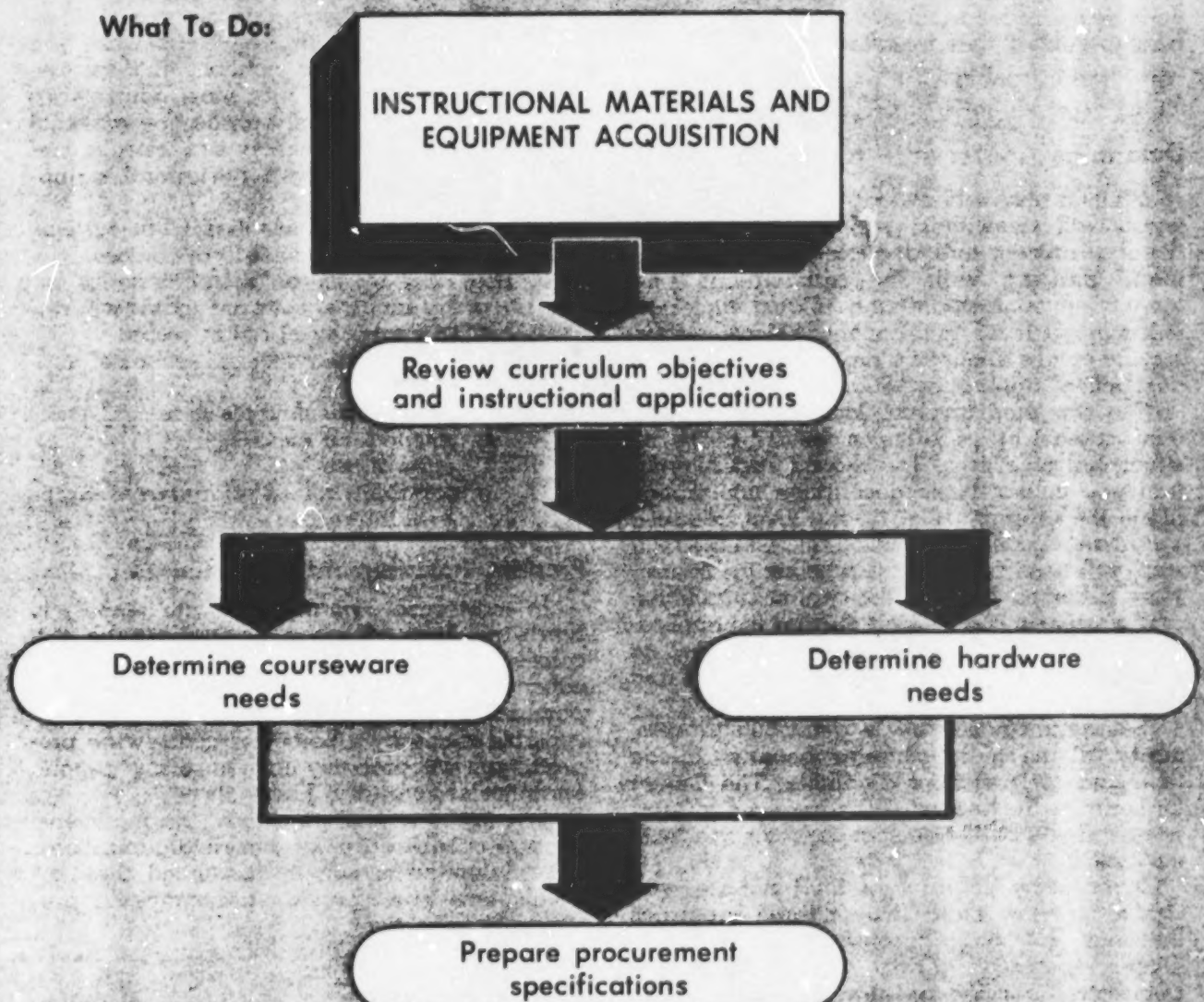


This is the stage most teachers and administrators are familiar with; in fact, this is where, unfortunately, many computer instruction programs start. By now, you know the rationale behind the sequence of stages we suggest. Just as with staff development, selecting equipment and courseware requires that you start with the curriculum objectives based on the student computer competency statements prepared by the curriculum committee. This stage deals with the evaluation and selection of appropriate courseware and hardware to realize those curriculum objectives.

What Needs To Be Accomplished:

- Procuring courseware and related instructional support materials
- Procuring hardware and related support services

What To Do:


INSTRUCTIONAL MATERIALS AND EQUIPMENT ACQUISITION
Review curriculum objectives and instructional applications
Determine courseware needs
Determine hardware needs
Prepare procurement specifications

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Review Curriculum Objectives and Institutional Applications

The specificity of the instructional applications developed during stage 2 should be sufficient to guide a determination of what materials and equipment will be required.

Determine Courseware Needs

While a review of available instructional materials will sometimes yield ideas for instructional strategies and applications, we recommend starting with the applications and identifying courseware and related materials that support those applications. Selecting courseware entails a four-step process: identification, description, application, and evaluation.

The first step involves locating courseware that, at least by its name, is related to the instructional objectives. The second step requires that you collect basic descriptive information about the program (e.g., grade level, required hardware, mode of instruction, etc.). In the third step, you need to determine whether the courseware is compatible with the overall curriculum, and whether it can support the specific applications you have in mind. Finally, you need to assess the courseware using both technical and pedagogical criteria.

Selecting courseware is a difficult process, made all the more complex because of the thousands of programs available. The Center for Learning Technologies has prepared a *Courseware Selection Guide* that can help you with the task.

In selecting courseware for purchase, you should preview those two or three programs that make it through the first three steps in the process outlined above. Some courseware publishers do make preview copies available. Once you have previewed those programs that appear most promising, you are ready to make procurement decisions.

Determine Hardware Needs

Selecting hardware systems is nearly as difficult as selecting courseware. Here too, however, there is a series of steps that can be followed.

For each application

1. Estimate how much time a student will need on the computer in order to accomplish the objectives.
2. Determine how many students can use the computer simultaneously.
3. Determine what hardware capabilities are required to run the courseware you are considering for purchase. (It is fast becoming the case that most courseware will run on several brands; the essential capabilities are memory size, storage medium, and required peripheral equipment.)
4. Identify the available hardware systems that have your required capabilities.
5. Rate each system on such criteria as
   a. the range of software that it will run
   b. its frequency of repair record
   c. available service and technical support
   d. potential for multiple uses
   e. potential for expansion
   f. ease of use
   g. capability of using different high-level languages

Prepare Procurement Specifications

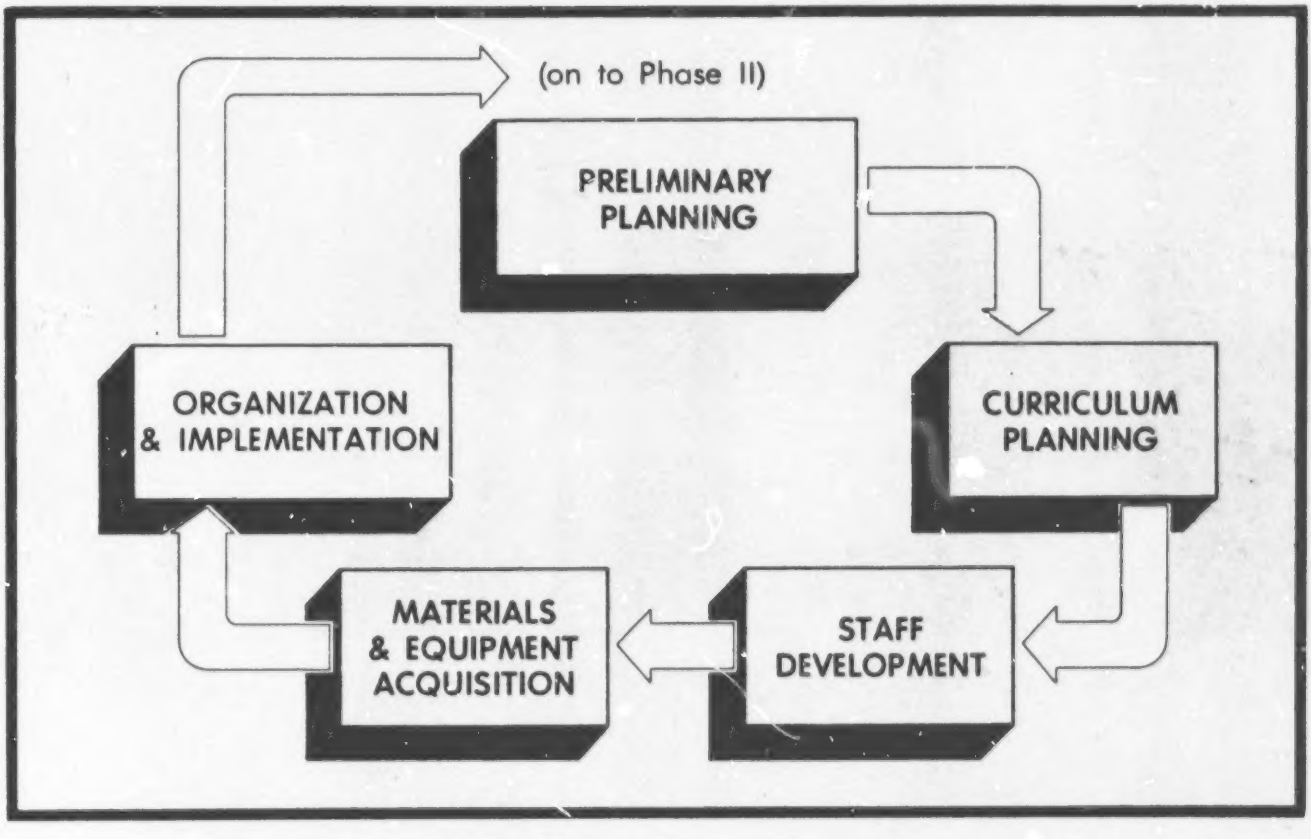
In most cases, particularly with respect to hardware, you will need to translate the outcomes of your selection process into bid specifications. This also may be the case with large purchases of courseware. While it usually is acceptable to specify a particular courseware program, you will probably have to stick to generic attributes in specifying hardware.

Investigate special purchasing arrangements through collaboratives or similar organizations. Not only are prices heavily discounted, these organizations often provide assistance in preparing specifications.

CONSIDER:

- Courseware and hardware selection requires considerable technical skills as well as educational experience. This is one area in which a skilled expert may be helpful in matching courseware and hardware to your instructional applications.
- Several comprehensive checklists and procedures have been devised for selecting hardware and courseware.
- Many districts are leasing hardware.
- What support services do vendors provide? Are service contracts available? What is their "track record" in providing service?

STAGE 5 ORGANIZATION AND IMPLEMENTATION



Despite all the planning and equipment, you still do not have a program until you organize those resources into a delivery system. Moving from planning and development to implementation requires attention to numerous details.

What needs to be accomplished:

- Providing logistical support for the program
- Establishing a system for supporting instructional applications

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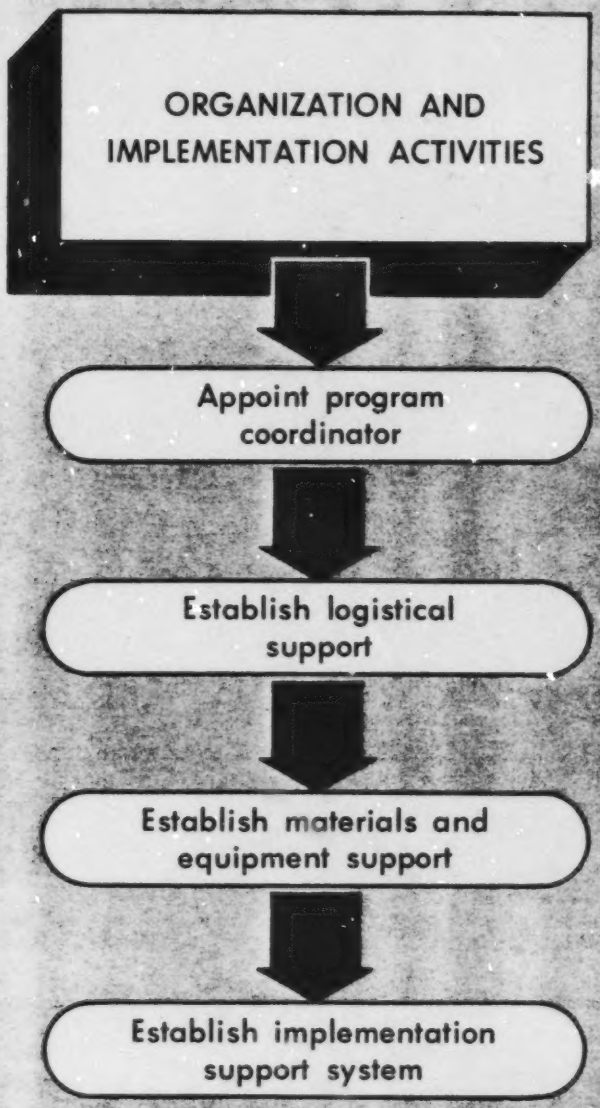
What To Do:



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Appoint Program Coordinator

It is unlikely that most school districts will be able to afford having a faculty member serve as full-time coordinator of computer instruction. A part-time role appears more reasonable, particularly for this first phase. Depending on the size of the district, consider appointing the director of curriculum or instruction, a building principal, or a teacher as a part-time coordinator. Building-level liaisons can also be helpful.

Establish Logistical Support System

By logistical support, we mean the resources and procedures for insuring that instructional materials and equipment are made available to teachers when needed. Few classrooms will be fully and permanently equipped with all of the materials and equipment necessary for computer instruction. In most cases (unless a computer lab is set up), limited supplies of courseware and computer systems will need to be allocated across classroom applications.

A distribution plan for each building will need to be developed in order that teachers can coordinate their instructional plans and schedules with available equipment and courseware. The school librarian or resource center coordinator might be able to take on this role. In some cases, a software library might need to be established for the district, with a distribution system for getting materials to schools.

Establish Materials and Equipment Support

There are several critical tasks that need to be undertaken in protecting the district's investment in courseware and computer systems:

Security. All equipment should be marked and stored in secure facilities when not in use.

Insurance. All equipment should be listed on the district's master list of insured equipment.

Inventory. Particularly as the amount of equipment grows, the location of each piece of equipment in the district is important. A similar inventory of courseware should be prepared.

Maintenance and repair. Computers are not as delicate as they appear, but they do require periodic maintenance and they do break down. Maintenance and repair contracts usually are available from the computer distributor or from special repair facilities.

Establish Implementation Support System

Realization of meaningful and lasting changes requires continuous attention. Moving from planning and development to incorporating computer instruction into the ongoing curriculum requires attention to several details. Consider the following ideas:

- Schedule meetings where the faculty can discuss implementation difficulties with their colleagues and share ideas for dealing with them. Use these sessions to be sure that everyone has a clear understanding of the program.
- Provide teachers with sufficient time to prepare or adapt instructional materials for their own use. They may need time to practice using the courseware on the computer.
- Encourage and support the principal in the role of a facilitator and resource person to the faculty.
- Pay attention to what is actually happening in classrooms. Insure that actual implementation is going according to plans. If not, find out why not.
- Keep faculty informed of program implementation activities throughout the school and district.
- Provide encouragement and support from the central office staff.
- Document implementation activities. What problems were encountered? How were they solved?

CONSIDER:

- Although you will want a program coordinator who is technically sound, be sure that he or she is recognized as an able curriculum leader. Avoid having the computer instruction program be perceived as primarily a technical undertaking.
- Use training sessions and other staff development activities to identify potential coordinators and facilitators.
- Since the computer instruction program usually is a district-wide priority, make plans for reporting back to the school committee on progress in implementation and student performance.

RECAPITULATION

As a review of the planning and implementation process, we have organized all of the activities into a master checklist that you may use to plot your own progress as you move through the stages.

STAGE 1: PRELIMINARY PLANNING

- ☐ Establish planning committee(s)
- ☐ Conduct staff awareness activities
- ☐ Develop educational philosophy and policies
- ☐ Document current computer-based activities
- ☐ Identify resources
- ☐ Conduct awareness for key groups
- ☐ Establish priorities

STAGE 2: CURRICULUM PLANNING

- ☐ Develop broad goal statements
- ☐ Develop student competency statements
- ☐ Develop curriculum objectives
- ☐ Develop instructional strategies and applications

STAGE 3: STAFF DEVELOPMENT

- ☐ Identify required faculty computer competencies
- ☐ Determine existing faculty computer competencies
- ☐ Organize required computer competencies
- ☐ Develop and provide training programs
- ☐ Develop and provide other staff activities
- ☐ Evaluate staff development activities

STAGE 4: INSTRUCTIONAL MATERIALS AND EQUIPMENT ACQUISITION

- ☐ Review curriculum objectives and instructional applications
- ☐ Determine courseware needs
- ☐ Determine hardware needs
- ☐ Prepare procurement specifications

STAGE 5: ORGANIZATION AND IMPLEMENTATION

- ☐ Appoint program coordinator
- ☐ Establish logistical support
- ☐ Establish materials and equipment support
- ☐ Establish implementation support system

REFERENCES

These selected references will be useful if you wish to pursue any of the planning and implementation activities in greater depth.

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